

U.S. Patent Application Serial No. 10/015,564
Amendment filed August 22, 2005
Reply to OA dated May 23, 2005

AMENDMENTS TO THE CLAIMS:

Please cancel claim 27 without prejudice or disclaimer, and amend claims 24 and 26, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-23 (Canceled).

Claim 24 (Currently Presented): A composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent is a reaction product obtained from reactants consisting essentially of the following (A) and (B):

(A) metaxylylendiamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric acid, maleic acid, malic acid, tartaric acid, isophthalic acid, terephthalic acid, pyromellitic acid, trimellitic acid or derivatives thereof having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer.

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Claim 25 (Previously Presented): The composition for coating according to claim 24, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 26 (Currently Amended): A composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent is a reaction product obtained from reactants consisting essentially of the following (A), (B) and (C):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric acid, maleic acid, malic acid, tartaric acid, isophthalic acid, terephthalic acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer;

(C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid and/or derivative thereof.

Claim 27 (Canceled)

Claim 28 (Previously Presented): The composition for coating according to claim 26, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 29 (Previously Presented): A coating comprising the composition for coating having a gas barrier property described in claim 24.

Claim 30 (Previously Presented): A coating comprising the composition for coating having a gas barrier property described in claim 26.

Claim 31 (Previously Presented): A coated film having a gas barrier property coated a gas barrier layer on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed by cure of a composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent is a reaction product of the following (A) and (B):

(A) metaxylylenediamine or paraxylyenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer.

Claim 32 (Previously Presented): The coated film according to claim 31, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 33 (Previously Presented): The coated film according to claim 31, wherein said flexible polymer is a polyolefin film, a polyester film or a polyamide film.

Claim 34 (Previously Presented): A coated film having a gas barrier property coated a gas barrier layer on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed by cure of a composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said amine curing agent is a reaction product of the following (A), (B) and (C):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer;

(C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid and/or derivative thereof.

Claim 35 (Previously Presented): The coated film according to claim 34, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine.

Claim 36 (Previously Presented): The coated film according to claim 34, wherein said (B) polyfunctional compound is acrylic acid moiety derived from metaxylylenediamine.

Claim 37 (Previously Presented): The coated film according to claim 34, wherein said flexible polymer film is polyolefin film, a polyester film or a polyamide film.

Claim 38 (Previously Presented): A multilayered laminate having a gas barrier property comprising two outer layers (S_1) and (S_2) and at least one intermediate layer comprising at least one gas barrier layer (G) interposed between said two outer layer (S_1) and (S_2), wherein said gas barrier layer (G) is a layer formed by cure of a composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent is a reaction product of the following (A) and (B):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide group moiety by reaction with polyamine to form an oligomer.

Claim 39 (Previously Presented): The multilayered laminate according to claim 38, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 40 (Previously Presented): The multilayered laminate according to claim 38, wherein each said outer layers (S_1) and (S_2) is flexible polymer film layer (F).

Claim 41 (Previously Presented): The multilayered laminate according to claim 40, wherein said flexible polymer film layer (F) is one film layer selected from the group consisting of a polyolefin film, a polyester film and a polyamide film.

Claim 42 (Previously Presented): The multilayered laminate according to claim 40, having flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) or flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F).

Claim 43 (Previously Presented): The multilayered laminate according to claim 38, wherein said outer layer (S₁) is flexible polymer film layer (F) and said outer layer (S₂) is paper layer (P) or metallic foil layer (M).

Claim 44 (Previously Presented): The multilayered laminate according to claim 43, having flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P), flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) or flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - paper layer (P).

Claim 45 (Previously Presented): The multilayered laminate according to claim 38, wherein said outer layer (S_1) is paper layer (F) or metallic foil layer (M) and said outer layer (S_2) is paper layer (P) or metallic foil layer (M).

Claim 46 (Previously Presented): The multilayered laminate according to claim 45, having paper layer (P) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - paper layer (P), metallic foil layer (M) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) or metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M).

Claim 47 (Previously Presented): The multilayered laminate according to claim 39, wherein said gas barrier layer (G) has an oxygen permeation factor of $0.2 \text{ cc} \cdot \text{mm/m}^2 \cdot \text{day} \cdot \text{atom}$ or below under the conditions of temperature 23°C and relative humidity 60%.

Claim 48 (Previously Presented): A multilayered laminate having a gas barrier property comprising two outer layers (S_1) and (S_2) and at least one intermediate layer comprising at least one gas barrier layer (G) interposed between said two outer layers (S_1) and (S_2), wherein said gas barrier layer (G) is a layer formed by cure of a composition for coating having a gas barrier property

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comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said amine curing agent is a reaction product of the following (A), (B) and (C):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer;

(C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid and/or derivative thereof.

Claim 49 (Previously Presented): The multilayered laminated according to claim 48, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine.

Claim 50 (Previously Presented): The multilayered laminate according to claim 48, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 51 (Previously Presented): The multilayered laminate according to claim 48, wherein each said outer layers (S_1) and (S_2) is flexible polymer film layer (F).

Claim 52 (Previously Presented): The multilayered laminate according to claim 51, wherein said flexible polymer film layer (F) is one film layer selected from the group consisting of a polyolefin film, a polyester film and a polyamide film.

Claim 53 (Previously Presented): The multilayered laminate according to claim 51, having flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) or flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F).

Claim 54 (Previously Presented): The multilayered laminate according to claim 48, wherein said outer layer (S₁) is flexible polymer film layer (F) and said outer layer (S₂) is paper layer (P) or metallic foil layer (M).

Claim 55 (Previously Presented): The multilayered laminate according to claim 54, having flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P), flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) or flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - paper layer (P).

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Claim 56 (Previously Presented): The multilayered laminate according to claim 48, wherein said outer layer (S_1) is paper layer (F) or metallic foil layer (M) and said outer layer (S_2) is paper layer (P) or metallic foil layer (M).

Claim 57 (Previously Presented): The multilayered laminate according to claim 56, having paper layer (P) - gas barrier layer (G) - metallic foil layer (M) - paper layer (P) - gas barrier layer (G) - paper layer (P), metallic foil layer (M) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) or metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M).

Claim 58 (Previously Presented): The multilayered laminate according to claim 48, wherein said gas barrier layer (G) has an oxygen permeation factor of $0.2 \text{ cc} \cdot \text{mm/m}^2 \cdot \text{day} \cdot \text{atom}$ or below under the conditions of temperature 23°C and relative humidity 60%.